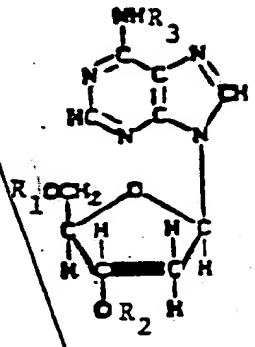
composition comprising an acyl derivative of 2'-deoxyadenosine, having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

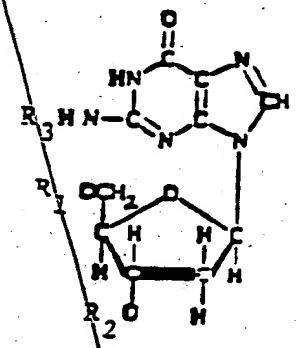
(a) an unbranched fatty acid with 3 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

48. (New) A method for treating or preventing mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxyguanosine having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

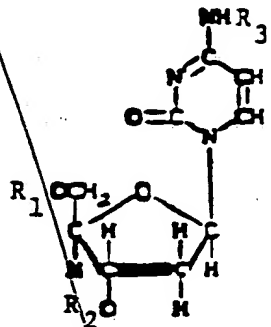
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, phenylalanine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

C1 cont'd

49. (New) A method for treating or preventing mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxycytidine, having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

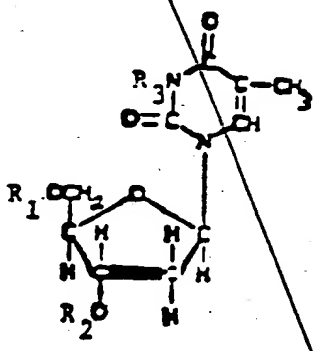
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be

acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

50. (New) A method for treating or preventing mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



C1 cont'd

wherein R_1 is an acyl group derived from

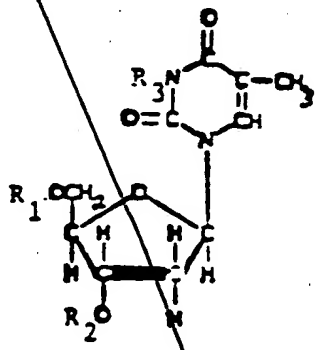
(a) an unbranched fatty acid with 3 to 15 or 17 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, and R_2 and R_3 are H, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

51. (New) A method for treating or preventing mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 is H, R_2 is an acyl group derived from

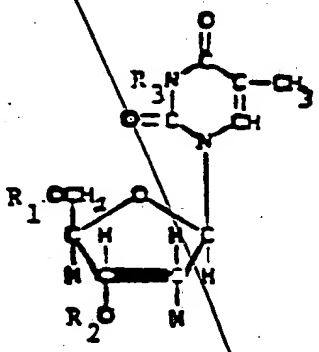
(a) an unbranched fatty acid with 3 to 13 or 15 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

52. (New) A method for treating or preventing mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



cont'd

wherein R_1 and R_2 are the same or different and each is an acyl group derived from

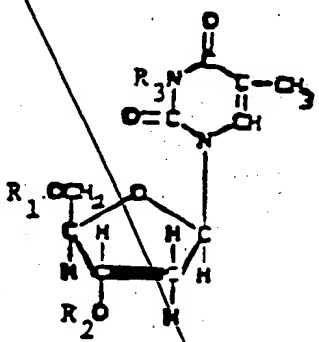
(a) an unbranched fatty acid with 5 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

53. (New) A method for treating or preventing a mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



C'd
cont'd

wherein R_1 and R_2 are the same or different and each is an acyl group derived from

(a) an unbranched fatty acid with 2 to 22 carbon atoms,

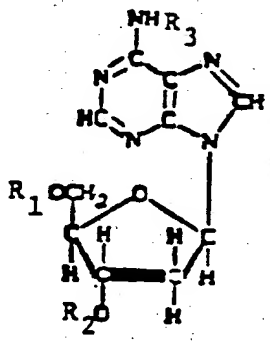
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline,

serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

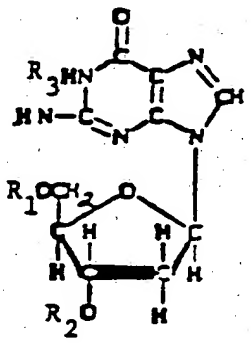
(c) nicotinic acid or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is an acyl group derived from an optionally substituted benzoyl or heterocyclic carboxylic acid that is substantially nontoxic, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

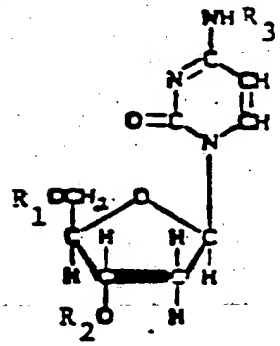
54. (New) A method for treating or preventing a mutagen-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an effective amount of each of at least two compounds selected from at least two of the groups of compounds having formulae



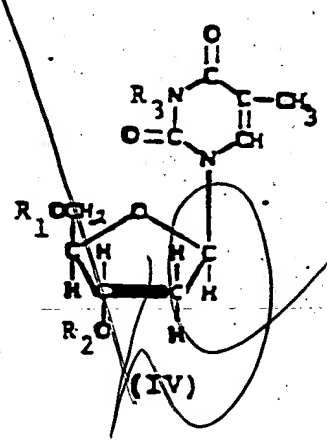
(I)



(II)



(III)



(IV)

wherein R_1, R_2, and R_3 are the same or different and each is H or an acyl group derived from a carboxylic acid, provided that at least one of said substituents R_1, R_2, and R_3 on each of said groups of compounds is not hydrogen, or pharmaceutically acceptable salts thereof, and a pharmaceutically acceptable carrier.